

Attorney Docket No. 632898-041

1. A method for elevating blood serum levels of calcium and/or magnesium cations in a human or other animal subject in need thereof comprising:
parenterally administering a safe and effective amount of a composition comprising at least one salt selected from the group consisting of calcium 3-hydroxy-3-methylbutyrate and magnesium 3-hydroxy-3-methylbutyrate to said subject.
2. The method of claim 1 wherein said composition comprises calcium 3-hydroxy-3-methylbutyrate.
3. The method of claim 2 wherein said composition contains calcium 3-hydroxy-3-methylbutyrate at a concentration of from about 1% to about 27% by weight.
4. The method of claim 3 wherein said composition is administered at a dosage providing from about 7 to about 14 millimoles of available calcium cation.
5. The method of claim 4 wherein said dosage is administered at a rate not exceeding 40 mg of calcium cation per minute.
6. The method of claim 2 wherein said step of administering a safe and effective amount of the composition comprises:
administering said composition at a rate to deliver from about 0.4 to about 3.0 mgs of elemental calcium per kg of subject weight per hour.
7. The method of claim 1 wherein said composition comprises magnesium 3-hydroxy-3-methylbutyrate.
8. The method of claim 7 wherein said composition contains magnesium 3-hydroxy-3-methylbutyrate at a concentration of from about 1% to about 32% by weight.

9. The method of claim 8 wherein said composition is administered to a subject suffering from magnesium deficiency at a dosage providing from about 94 to about 188 mg of elemental magnesium per hour for a period of time sufficient to increase serum levels of magnesium to normal levels.
10. The method of claim 8 wherein said step of administering a safe and effective amount of the composition comprises:
administering said composition at a rate to deliver from about 188 to about 376 mg of elemental magnesium per day.
11. The method of claim 10 wherein said composition delivers a sufficient amount of magnesium to a subject in need thereof to maintain magnesium levels at acceptable levels during prolonged intravenous fluid delivery.
12. The method of claim 1 wherein said composition comprises calcium 3-hydroxy-3-methylbutyrate and magnesium 3-hydroxy-3-methylbutyrate.
13. The method of claim 12 wherein said composition comprises from about 100:1 to about 1:100 calcium 3-hydroxy-3-methylbutyrate to magnesium 3-hydroxy-3-methylbutyrate by weight.
14. The method of claim 13 wherein said composition comprises from about 20:1 to about 2:1 calcium 3-hydroxy-3-methylbutyrate to magnesium 3-hydroxy-3-methylbutyrate by weight.
15. A method for preventing and/or treating a condition associated with calcium and/or magnesium deficiency in a human or other animal subject comprising parenterally administering to said subject a safe and effective amount of a composition comprising at least

one salt selected from the group consisting of calcium 3-hydroxy-3-methylbutyrate and magnesium 3-hydroxy-3-methylbutyrate.

16. The method of claim 15 wherein said condition is selected from the group consisting of hypocalcemia, hypomagnesia, hyperkalemia, overdosage of magnesium sulfate, lactation tetany, exchange transfusions, long-term electrolyte replacement therapy, cardiac resuscitation, bites of venomous spiders, stings of puss caterpillars, cardiac arrhythmia, eclampsia, recurrent seizures, pregnancy-induced hypertension, pre-term labor and combinations thereof.

17. The method of claim 15 wherein said composition comprises calcium 3-hydroxy-3-methylbutyrate.

18. The method of claim 17 wherein said composition contains calcium 3-hydroxy-3-methylbutyrate at a concentration of from about 1% to about 27% by weight.

19. The method of claim 18 wherein said composition is administered at a dosage providing from about 7 to about 14 millimoles of available calcium cation.

20. The method of claim 17 wherein said step of parenterally administering a safe and effective amount of the composition comprises:

administering said composition at a rate to deliver from about 0.4 to about 3.0 mgs of elemental calcium per kg of subject weight per hour.

21. The method of claim 15 wherein said composition comprises magnesium 3-hydroxy-3-methylbutyrate.

22. The method of claim 21 wherein said composition contains magnesium 3-hydroxy-3-methylbutyrate at a concentration of from about 1% to about 32% by weight.

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23. The method of claim 22 wherein said composition is administered to a subject suffering from hypomagnesia at a dosage providing from about 94 to about 188 mg of elemental magnesium per hour for a period of time sufficient to increase serum levels of magnesium to normal levels.

24. The method of claim 22 wherein said step of administering a safe and effective amount of the composition comprises:

administering said composition at a rate to deliver from about 188 to about 376 mg of elemental magnesium per day.

25. The method of claim 24 wherein said composition delivers a sufficient amount of magnesium to a subject in need thereof to maintain magnesium levels at acceptable levels during prolonged intravenous fluid delivery.

26. The method of claim 15 wherein said composition comprises calcium 3-hydroxy-3-methylbutyrate and magnesium 3-hydroxy-3-methylbutyrate.

27. The method of claim 26 wherein said composition comprises from about 100:1 to about 1:100 calcium 3-hydroxy-3-methylbutyrate to magnesium 3-hydroxy-3-methylbutyrate by weight.

28. The method of claim 27 wherein said composition comprises from about 20:1 to about 2:1 calcium 3-hydroxy-3-methylbutyrate to magnesium 3-hydroxy-3-methylbutyrate by weight.

29. A composition for elevating blood serum levels of alkaline earth metal cations in a human or other animal subject in need thereof comprising:

- (a) an alkaline earth metal component,
- (b) a biocompatible organic acid component, and

(c) a sterile aqueous solution selected from the group consisting of normal saline, lactated ringers, and 5% dextrose in water,

wherein said alkaline earth metal is selected from the group consisting of calcium, magnesium, and mixtures thereof, and said biocompatible organic acid comprises 3-hydroxy-3-methylbutyric acid,

wherein said composition is suitable for parenteral administration to said subject.

30. The composition of claim 29 wherein said sterile aqueous solution is normal saline.

31. The composition of claim 29 wherein said alkaline earth metal is calcium.

32. The composition of claim 31 wherein the alkaline earth metal is present at a concentration of from about 1.4 mg per milliliter to about 37 milligrams per milliliter.

33. The composition of claim 31 wherein the alkaline earth metal is present at a concentration of about 13.7 milligrams per milliliter.

34. The composition of claim 29 wherein said alkaline earth metal is magnesium.

35. The composition of claim 34 wherein the alkaline earth metal is present at a concentration of from about 0.9 mg per milliliter to about 30 milligrams per milliliter.

36. The composition of claim 34 wherein the alkaline earth metal is present at a concentration of about 9.4 milligrams per milliliter.

37. The composition of claim 29 wherein the alkaline earth metal component is a mixture of calcium and magnesium.

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38. The composition of claim 37 wherein the ratio of calcium to magnesium is from about 1:100 to about 100:1 by weight.

39. The composition of claim 37 wherein the ratio of calcium to magnesium is from about 20:1 to about 2:1 by weight.